UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,766	12/16/2003	Samir W. Habboosh	02570-P0013A	5722

24126 7590 04/05/2006

ST. ONGE STEWARD JOHNSTON & REENS, LLC
986 BEDFORD STREET
STAMFORD, CT 06905-5619

EXAMINER	
VERBITSKY, GAIL KAPLAN	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/736,766	HABBOOSH, SAMIR W.	
	Examiner	Art Unit	
	Gail Verbitsky	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-83* is/are pending in the application.

4a) Of the above claim(s) *82 and 83* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-81* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *82 and 83* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 30 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It is not clear how the limitation including "substrate" further limits the claims. Perhaps applicant should insert –on said substrate—after "depositing" on line 2. Is this a proper interpretation of the invention?

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-17, 26, 38-49, 51-56, 59-61, 64-67, 76-77, 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson (U.S. 3462318) in view of Shoji et al (U.S. 6511523) [hereinafter Shoji] and Topp et al. (U.S. 4276142).

Bjornson discloses in Fig. 1 a thermocouple comprising first and second electrically conductive components making a junction 3. The components, inherently, comprise dissimilar metals, which can be platinum-rhodium, iridium-rhenium, tungsten-rhenium (noble) metals coated with zirconia oxide coating 9 (col. 2, lines 41-45). The device further comprises lead wires (wound conductors 1, 2) to, inherently, transmit the

temperature related voltage signal (voltage varying as a function of temperature) to a voltage metering device (transducer), as very well known in the art of thermocouples.

For claim 2: the second component can be iridium-rhenium, thus, comprising rhenium, which is a part of a first component, when the first component is tungsten-rhenium.

For claims 4, 6: the first component can be platinum-rhodium.

For claim 5: the second component can be platinum-rhodium.

For claims 7-8: the second component can be platinum-rhodium alloy, inherently, comprising rhodium.

Bjornson does not explicitly teach the particular composition of the first electrically conductive component and a second electrically conductive component, as stated in claim 1, with the remaining limitations of claims 1-17, 26, 38-49, 51-56, 59-61, 64-67, 76-77, 81.

Shoji teaches to creep strengthen (especially grain boundaries) platinum material (second noble metal) by dispersion zirconium oxide in the platinum (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device, disclosed by Bjornson, so as to make the first component by dispersion zirconium oxide in the grain boundaries and within the metal of the first component, as taught by Shoji, in order to creep strengthen the component, as already suggested by Shoji.

Topp teaches to disperse zirconium oxide within platinum or a platinum containing metal so as to inhibit the effect or recrystallization especially when the electrode/ wire is used in the exhaust and make it more stable at operating temperatures. Topp states that other noble metals could be used.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device, disclosed by Bjornson, so as to make the second component by dispersion zirconium oxide in the grain boundaries and within the metal of the first component, as taught by Topp, in order to make it more stable at high temperatures.

With respect to using a dispersion hardening process: It is very well known in the art to use dispersion harden process to disperse one compound into another. (See, for

example, Nicoll who teaches to manufacture fine-grained oxide dispersion hardened metal material using yttrium since it can tolerate high temperatures. Thus, yttrium oxide particles contained in the oxide dispersion hardened alloy/ superalloy of a component/ matrix/main body.

The method steps will be met during the normal manufacturing process of the device stated above.

4. Claims 29, 32, 33-35, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson, Shoji and Topp as applied to claims 1-17, 26, 38-49, 51-56, 59-61,64-67, 76-77, 81 above, and further in view of McTaggart et al. (U.S. 3379578) [hereinafter McTaggart].

Bjornson, Shoji and Topp disclose the device as stated above.

They do not explicitly teach the limitations of claims 29, 32, 33-35, 80.

McTaggart discloses a device in the field of applicant's endeavor wherein the electrical components (thermocouple legs) are covered with a sheath 20 and a refractory layer 24 made of MgO and positioned between said sheath 20 and the electrical components as shown in Fig. 1. McTaggart also using platinum/ rhodium thermocouple and iridium/ rhodium states that such a thermocouple could stand the temperatures up to 1600C to 2000C.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a refractory insulation and a sheath, as taught by McTaggart, to the device disclosed by Bjornson, Shoji and Topp, in order to protect the device from harsh environment and high temperatures, as very well known in the art.

For claim 30: the use of the particular material, i.e., one noble metal and oxide, for the sheath, absent any criticality, is only considered to be the "optimum" material that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide for the probe element disclosed by Bjornson, Shoji and Topp since it has been held to be a matter of obvious design choice and within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. In re Leshin, 125 USPQ 416.

For claim 31: the use of the particular material, i.e., high temperature alloy, for the sheath, absent any criticality, is only considered to be the "optimum" material that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide for the probe element disclosed by Bjornson, Shoji and Topp since it has been held to be a matter of obvious design choice and within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. In re Leshin, 125 USPQ 416.

For claim 34: the use of the particular material, i.e., alumina, for the insulation, absent any criticality, is only considered to be the "optimum" material that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide for the probe element disclosed by Bjornson, Shoji and Topp since it has been held to be a matter of obvious design choice and within the

general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. In re Leshin, 125 USPQ 416.

5. Claims 22-26, 29, 32-34, 58, 72-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson, Shoji and Topp, as applied to claims 1-17, 26, 38-49, 51-56, 59-61,64-67, 76-77, 81 above, and further in view of Piai (U.S. 4989992).

Bjornson, Shoji and Topp disclose the device as stated above.

They do not explicitly teach the limitations of claims 22-26, 29, 32-34, 58, 72-75.

Piai discloses a device comprises a thermocouple, inherently, having two electrically conductive components, inherently, made of dissimilar materials (platinum/ platinum-rhodium) making a junction 13. Piai teaches to enclose the components in a sheath/ covering 16 separated from the wires by a ceramic electrical and thermal insulation (alumina and zirconia, col. 2, lines 40-41) 14. The thermocouple 3 is connected to electronics (conditioner) 4 (col. 3, lines 1-7 and col. 4, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a conditioner electronics, as taught by Piai, so as to provide the device with a proper interface and make a temperature related signal well corresponding to the temperature being measured, so as to have adequate voltage/ power readable by an electronic circuit, in order to provide the operator with a correct temperature related data.

The method steps will be met during the normal manufacturing process of the device stated above.

6. Claims 18-21, 50, 57, 68-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson, Shoji and Topp as applied to claims 1-17, 26, 38-49, 51-56, 59-61,64-67, 76-77, 81 above, and further in view of MacRitchie et al. (U.S. 3270547).

Bjornson, Shoji and Topp disclose the device as stated above.

They do not explicitly teach the limitations of claims 18-21, 50, 57, 68-71.

MacRitchie teaches to calibrate thermocouples by using standard temperature established by the National Bureau of Standards, inherently, used by National Institute of Standard, aka NIST.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to calibrate the thermocouple using standards, as taught by MacRitchie, in order to achieve more accurate results of measurements, as very well known in the art.

With respect to claims 20, 71: the choice of using the International System of Standards International Electrotechnical Commission reference), to calibrate thermocouple, absent any criticality, is only considered to be the "preferred" or "optimum" system of standards that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the intended use of the device, i.e., use the device in Europe would require its calibration according to International Standards. See In re Bosch, 205 USPQ 215 (CCPA 1980).

The method steps will be met during the normal manufacturing process of the device stated above

7. Claims 32-35, 37, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson, Shoji and Topp, as applied to claims 1-17, 26, 38-49, 51-56, 59-61,64-67, 76-77, 81 above, and further in view of Stevenson et al. (U.S. 6302578) [hereinafter Stevenson].

Bjornson, Shoji and Topp disclose the device as stated above.

They do not explicitly teach the limitations of claims 32-35, 37.

Stevenson discloses a thermocouple whose first and second electrically conductive components having an inner protective sheath (refractory insulation) made of alumina or magnesia or a mixture thereof, and an outer protective sheath. Stevenson states that the thermocouple protected in such protection sheath would be able to withstand high (1700 F) temperatures (col. 4, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add an insulation protective sheath and an outer protective sheath onto the conductor, as taught by Stevenson, so as to have a better protection of the conductor in a high temperature harsh corrosive environment and to avoid shorting of the conductor, as very well known in the art.

The method steps will be met during the normal manufacturing process of the device stated above.

8. Claims 27-28, 36, 62-63, 78-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson, Shoji and Topp, as applied to claims 1-17, 26, 38-49, 51-56, 59-61,64-67, 76-77, 81 above, and further in view of Hines (U.S. 3767470).

Bjornson, Shoji and Topp disclose the device as stated above.

They do not explicitly teach the limitations of claims 27-28, 36, 62-63, 78-79.

Hines teaches a heat flow (heat flux) sensor comprising an array of parallel (or serially) connected thermocouples (thermopile) deposited onto a substrate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device, disclosed by Bjornson, Shoji and Topp, so as to make a heat flux sensor comprising a thermopile engaging the thermocouples, disclosed by Bjornson, Shoji and Topp, so as to use the device comprising a thermocouple for measuring a heat flux, as very well known in the art.

The method steps will be met during the normal manufacturing process of the device stated above.

9. Claims 29, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson, Shoji and Topp, as applied to claims 1-17, 26, 38-49, 51-56, 59-61,64-67, 76-77, 81 above, and further in view of Stansfeld et al. (U.S. 5423610) [hereinafter Stansfeld].

Bjornson, Shoji and Topp disclose the device as stated above.

They do not explicitly teach the limitations of claim 29, 31.

Stansfeld discloses in Fig. 7 a thermocouple having a high temperature alloy sheath housing both (at least one) thermocouple components.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a high temperature alloy sheath, as taught by Stainfeld, to the device disclosed by Bjornson, Shoji and Topp, so as to better protect the thermocouple elements from hot and harsh corrosive environment and high temperature, as very well known in the art.

The method steps will be met during the normal manufacturing process of the device stated above.

Response to Arguments

10. Applicant's arguments with respect to claims 1-81 have been considered but are moot in view of the new ground(s) of rejection necessitated by the present amendment.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods.

Alexander et al. (U.S. 3180727) teaches that a metal composition comprising a refractory oxide dispersed by dispersion hardening in a metal matrix have an exceptional stability at elevated temperatures, stress tests and creep rupture tests. It is inherent, that the refractory oxide, during dispersion, would fill out / deposited within the grain boundaries and within the main portion (within the matrix).

Nicoll teaches to manufacture fine-grained oxide dispersion hardened metal material using yttrium since it can tolerate high temperatures. Thus, yttrium oxide particles contained in the oxide dispersion hardened alloy/ superalloy of a component/ matrix (main body

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gail Verbitsky whose telephone number is 571/ 272-2253. The examiner can normally be reached on 7:30 to 4:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571/ 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GKV

Gail Verbitsky
Primary Patent Examiner, TC 2800

March 20, 2006